

Pond E Sampling and Analysis

The work consisted of conducting in-situ dredge material sampling and analytical laboratory analysis at Pond E in accordance with the requirements of Condition I.F.11 of Possum Point Power Station's VPDES Permit (Permit No. VA0002071).

Project Background

Based on a review of the original design plans for Pond E and topographic mapping developed in March 2015 by GAI Consultants, Inc., it is estimated that Pond E contains approximately 870,000 cubic yards (CY) of ash. The depth of ash varies along the pond, but it is estimated that the maximum thickness of ash extends approximately 35 to 40 feet with an average thickness of approximately 15 feet. Pond E also has free water over a portion of the ash. The pool elevation of the water varies with precipitation and the water depth varies across the pond. At the time of development of the topographic mapping in March 2015, it was estimated that the volume of water was approximately 52.5 million gallons and extends to a depth of approximately 17 feet.

As part of the clean closure activities planned for Pond E, ash is proposed to be mechanically dredged from the pond and transported to Pond D. In accordance with the requirements of Condition I.F.11 of the VPDES Permit, the dredge material was sampled and analyzed.

Scope of Work

The Pond E sampling and laboratory analysis were completed in accordance with applicable state and federal guidelines, regulations, and requirements as applicable to the subsurface conditions encountered. The sampling and laboratory analysis evaluated the ash material for comparison to criteria established under Condition I.F.11 of the VPDES Permit.

In accordance with Condition I.F.11 of the VPDES Permit, for volumes greater than 300,000 CY, one representative sample is required for each 100,000 CY of dredge material. The sample should be a composite of the proposed dredge material to the depth of the intended dredge. Based on evaluation of the ash thickness and pond dimensions, the dredge volume from Pond E was estimated to be approximately 870,000 CY. Using a volume estimate factor of 20% to account for additional volumes due to estimation error and over excavation of pond bottom material, the final estimated volume of dredge is 1,044,000 CY.

Based on an estimated 1,044,000 CY of dredge, and in accordance with the requirements of one sample per 100,000 CY of dredge material, the collection of a total of 11 representative samples plus one quality assurance/quality control (QA/QC) sample (12 total samples) were collected.

Sample Location Determination

To facilitate collection of samples representative of the approximately 38 acre pond and estimated thickness of ash, a total of 11 soil borings were advanced across Pond E. Boring locations were selected using a systematic random sampling technique in order to generate a representative sampling of the pond material. Soil boring locations were generated using the Visual Sampling Plan (VSP) Software. VSP is a software tool developed by Pacific Northwest National Laboratory (PNNL) for the United States (US) Department of Energy (DOE). The software was designed for selecting the right number and/or location of environmental samples so that the results of the statistical tests performed on the data collected via the sampling plan would have the required confidence for decision making.

Using the simple random sampling option of VSP, random sampling locations were generated within a predefined study area. Using the general perimeter of Pond E as the study area and specifying a total of 11 sample locations, a sample location map was developed. Black diamond symbols presented on the attached Figure 1 (Exhibit A) represent the planned sample locations generated using the VSP software.

Due to physical constraints in accessing some of the sample locations, such as water inundation and very soft ash conditions, planned soil boring for some locations required adjustment. Three sample locations (E6, E7, and E8) were slightly adjusted to avoid very soft ash conditions. In addition, the planned locations of three other samples (E9, E10, and E11) were adjusted over a relatively larger distance as the original planned locations were found to be inaccessible. The final locations of adjusted samples are presented as blue squares on the attached Figure 1. Coordinates for each sample location are provided in the attached Table 1 (Exhibit B).

Sample Collection

Soil borings were advanced at the designated sample locations to facilitate collection of the required dredge material samples. Soil borings advanced within the ash areas of pond were advanced using a track mounted drilling rig. Even within the drier portions of the pond area, matting was required to provide stability and assist in the movement of the drill rig from one soil boring to the next. Soil borings advanced within the ash areas were backfilled with auger cuttings.

In all cases, soil borings were advanced from the ground/water surface to a depth of at least two feet below the bottom of the ash material or auger refusal, whichever was encountered first. For this investigation, auger refusal was not encountered in any of the boreholes prior to reaching the planned depth of drilling.

Soil borings were advanced using a combination of continuous split-spoon sampling and hollow stem auger drilling. Each split-spoon sample was examined by the GAI field environmental scientist immediately after removal from the sampler, visually characterized, and inspected for the presence of staining, discoloration, separate-phase hydrocarbon product, or other visible indicators of contamination. The split spoon samples were scanned with a photoionization detector (PID), calibrated daily to isobutylene, for the presence and concentration of volatile organic vapors. Soil boring logs with ash/soil descriptions and PID readings for each of the soil borings were prepared by the GAI environmental scientist and are provided in the attached Exhibit C. GAI collected 12 environmental samples (one sample per soil boring plus one QA/QC sample) for laboratory analyses to evaluate the proposed dredge material. The sample collected for laboratory analysis of all parameters, excluding the volatile organic fraction, were collected as a single composite from each soil boring. A composite sample was collected by retaining a portion of each split-spoon retrieved from a given soil boring in a clean disposable container. Once an individual soil boring was completed, the retained sample was transferred to a stainless steel mixing bowl and thoroughly mixed. The thoroughly mixed sample was then transferred in equal portions to appropriate laboratory supplied sample jars.

For collection of the volatile organic fraction, each split spoon was visually examined for the presence of suspected contamination and screened with a PID. Soil samples for volatile organic analyses were selected from a discrete interval in each boring exhibiting the highest PID readings or other indicators of possible impacts. If no indicators of potential impacts were observed, the sample was collected from a randomly selected depth interval. Selection of the depth interval took into consideration previously completed soil borings in an effort to distribute samples between the top, middle and bottom thirds of the dredge material. Samples collected for the volatile organic fraction analyses were transferred into the appropriate laboratory provided sample jars or prepreserved sample vials depending on the analyses required.

Equipment used for sample collection was properly decontaminated before use to prevent cross-contamination from prior sampling locations. Field sampling equipment used to collect or hold non-aqueous samples were decontaminated prior to each use as follows:

1. Remove visible contamination from the equipment using a brush and/or paper towel saturated with potable water and laboratory grade soap.
2. Rinse the equipment with potable water to remove residual soap and solids.
3. Rinse the equipment with distilled/deionized water meeting ASTM Type II specifications.

Laboratory Analysis

Samples collected for laboratory analysis were properly labeled with the sampling time, date, and sample identification, and were immediately placed into an iced chest and maintained at four degrees Celsius. Samples were submitted, under chain of custody procedures, to ALS Environmental, a VA certified analytical laboratory, under a rush turn-around for results. Samples were submitted for analysis of the required parameters and using appropriate laboratory test methods as specified in Condition I.F.11 of VPDES Permit No. VA0002071.

Reporting

Results of the completed laboratory analysis are presented in the attached Exhibit D. Analytical results are presented on the appropriate VPDES Permit No. VA0002071, Dredge Spoils Monitoring, Attachment B forms. The ALS laboratory analytical data reports providing all results for the submitted samples are provided in Exhibit E. Analytical results indicate all constituent concentrations are below applicable threshold values provided in Attachment B of VPDES Permit No. VA0002071.